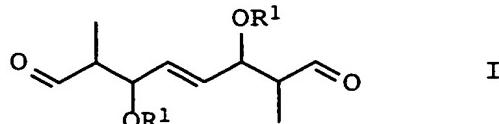


We claim:

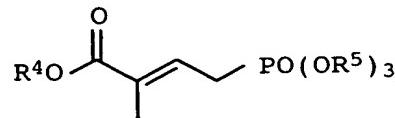
1. A process for preparing carotenoids, which comprises reacting
 5 a dialkoxy dialdehyde of the general formula I



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with R¹ = C₁-C₆-alkyl, in a double Wittig condensation with a phosphonium salt of the formula II or in a double Wittig-Horner condensation with a phosphonate of the formula III

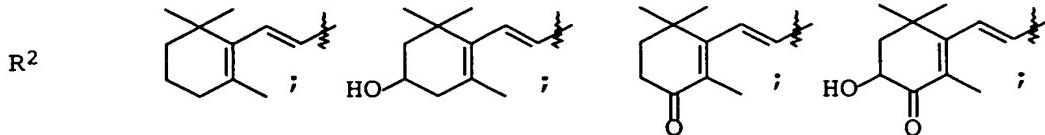
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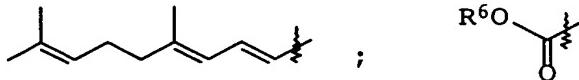
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in which the substituents have independently of one another the following meaning:

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R³ aryl;

R⁴ to R⁶

C₁-C₆-alkyl and

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X⁻ an anion equivalent of an inorganic or organic acid.

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2. The process according to claim 1, wherein X⁻ is the anion equivalent of an acid selected from the group consisting of hydrohalic acid, sulfuric acid, phosphoric acid, formic acid,

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acetic acid and sulfonic acid.

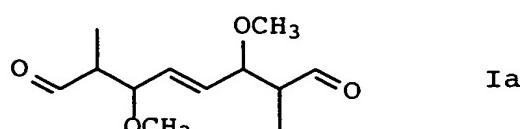
3. The process according to claim 2, wherein X^- is Cl^- , Br^- , $C_nH_{2n+1}SO_3^-$ with $n = 1-4$, $Ph-SO_3^-$, $p-Tol-SO_3^-$ or $CF_3-SO_3^-$.

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4. The process according to any of claims 1 to 3 for preparing a carotenoid selected from the group consisting of astaxanthin, lycopene and canthaxanthin, which comprises reacting a dialkoxy dialdehyde of the formula Ia

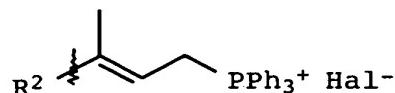
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with a phosphonium salt of the formula IIa,

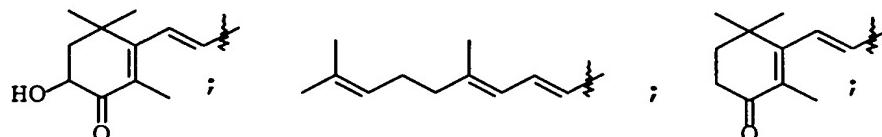
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IIa

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in which the substituents have independently of one another the following meaning:

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Ph phenyl;

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Hal halide.

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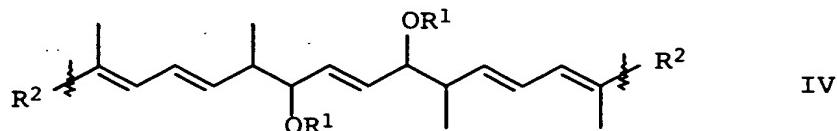
5. The process according to any of claims 1 to 4, wherein the reaction is carried out in a C₁-C₆ alcohol using an alkali metal or alkaline earth metal alkoxide as base.

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6. The process according to any of claims 1 to 5, wherein the reaction product is thermally isomerized into the all(E) form and isolated by filtration.

7. Compounds of the formula IV,

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in which the substituents R¹ and R² have independently of one another the meaning stated in claim 1.

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